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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,512	11/30/2001	Minquan Cheng	2001B111	6517

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EXXONMOBIL CHEMICAL COMPANY
P O BOX 2149
BAYTOWN, TX 77522-2149

EXAMINER

NGUYEN, TAM M

ART UNIT PAPER NUMBER

1764

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/998,512

Applicant(s)

CHENG ET AL.

Examiner

Tam M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 12, 2004 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2 and 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsia et al. (4,506,106) in view of Kuechler et al. (6,441,261) or Kuechler et al. (6,121,540).

Hsia discloses a process for converting an oxygenated hydrocarbon including methanol (MeOH), dimethylether (DME), or the like to produce olefins by contacting the oxygenated hydrocarbon with a catalyst to form an olefin composition comprising water and oxygenated hydrocarbon (e.g., methanol and DME) and cooling and separating the olefin composition into an olefin containing vapor stream and water containing stream. The vapor stream is then compressed and separated into an olefin product and an oxygenated hydrocarbon stream which is then combined with the water containing stream to produce a combined stream which is then passed into a separation zone to recover an oxygenated hydrocarbon product. From Figure 2, it appears that the compressed vapor stream is contacted with water from the oxygenates stripper. It is noted that Hsia does not disclose that the catalyst is a molecular sieve catalyst. However, Hsia discloses that the catalyst is a ZSM-5 which is a molecular sieve. It is noted that Hsia does not specifically disclose that the water containing stream comprises at least 1 wt. % of oxygenated hydrocarbon. However, Hsia discloses that 25-90% of feedstock is converted per reactor pass and the water containing stream contains majority of the unconverted oxygenated hydrocarbon. Therefore, it would be expected that the water containing stream comprises at least

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1 wt. % of oxygenated hydrocarbon as claimed. (See col. 2, lines 8-24, lines 53-59; col. 3, line 48 through col. 4, line 63; Table I; col. 5, lines 39-68; col. 6, lines 10-43; figure 2)

Claim 1:

Hsia does not disclose that the effluent product from the reaction zones cooled by quenching with a medium.

Both references of Kuechler disclose a process for converting oxygenates to olefins wherein the olefinic product stream is quenched with medium such as water to cool the product stream. (See Kuechler'504; abstract, col. 6, line 63 through col. 7, line 6; see Kuechler'261; col. 10, line 58 through col. 11, line 16)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hsia by utilizing a quench step as disclosed by Kuechler because such step is effective to cool the olefinic product, increase heat recovery and improve heat integration.

Claim 2:

Hsia does not disclose a step for recovering a propylene containing stream. However, Hsia teaches the steps for recovery of an ethylene (also known as ethene) stream and a C₃₊ stream (See figure 1; col. 5, lines 26-33). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hsia by separating propylene from the C₃₊ stream because one of skill in the art would separate propylene from the C₃₊ stream because propylene is a valuable product in a polymerization process.

Claim 5:

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The water containing stream and the oxygenated hydrocarbon containing stream are first combined and then separated in a separator (oxygenated stripper). (See Hsia's figure 2)

Claim 6:

Hsia does not disclose that the water containing stream and the oxygenated hydrocarbon containing stream are both combined and separated within a separator. However, water is separated from oxygenated hydrocarbons in the stripper (see Hsia's figure 2). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hsia by combining and separating the streams within a separator because it would be expected that the results would be the same or similar when either (1) combining the streams within a separator or (2) combining the streams and then separating in a separator because in both cases water is separated from the oxygenated hydrocarbons. If the two streams are mixed within a separator in the process of Hsia, one of skill in the art might use a different separator (e.g., distillation, adsorption, or stripper) which is to be effective to separate water from oxygenated hydrocarbons.

Claim 7:

The vapor stream is compressed at 310 psig (see col. 6, lines 10-11).

Claims 8-11:

Hsia does not disclose that the oxygenated hydrocarbon product contains not greater than 50, 40, 30, or 25 wt. % of water. However, Hsia desires to employ a feedstock which may comprise about 4 to 17 % water. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hsia by producing an oxygenated hydrocarbon product comprising the claimed amount of water because

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the oxygenated hydrocarbon product would be combined with the methanol feedstock and Hsia desires a combined feedstock comprising a small amount of water (see col. 3, lines 66-67; col. 4, lines 19-24). Therefore, it would be effective to produce an oxygenated hydrocarbon product containing the claimed amount of water.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over references as applied to claim 2 above, and further in view of Kuechler et al. (6,137,022).

Claims 3 and 4:

Hsia does not disclose a step of polymerizing the ethylene and propylene containing streams.

Kuechler teaches that olefin products, which are obtained from a MTO process, can be polymerized (see col. 4, lines 61-65).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hsia by polymerizing the ethylene and propylene containing streams as taught by Kuechler because the polymerizing step is known in the art and one of skill in the art would polymerize the ethylene and propylene containing streams since polyethylene and polypropylene product can be used in hundreds of applications (e.g., plastics)

Response to Remarks (filed on 3/29/04)

The argument that Hsia does not contact the olefin composition that contains olefin, water and oxygenated hydrocarbon with a quench fluid to cool the composition is not persuasive because of a new rejection above.

The argument that Hsia does not describe a benefit of being able to recover a high concentration of oxygenated hydrocarbon in the water stream from his separator 16 and fails to provide sufficient teaching that would enable one to expect that such a water stream would be expected to contain at least 1 wt.% of oxygenated hydrocarbon is not persuasive. Even though Hsia does not disclose the benefit of being able to recover a high concentration of oxygenated hydrocarbon in the water stream from separator 16, Hsia teaches the water stream from contains majority of unreacted oxygenated hydrocarbon (col. 4, line 37-38). Hsia also teaches that the MTO conversion is about 25-90 %. Therefore, it would be expected that the water containing stream comprises at least 1 wt.% of oxygenated hydrocarbon as claimed.

The argument that Kuechler'022 is not concerned with separating oxygenated hydrocarbon from the olefin product is not persuasive because the examiner relied upon Kuechler'033 to teach that the polymerization of olefins is known in that art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam M. Nguyen whose telephone number is (571) 272-1452. The examiner can normally be reached on Monday through Thursday.

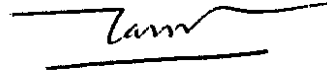
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Tam M. Nguyen
Examiner
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TN

A handwritten signature in black ink, appearing to read 'Tam', is written over a horizontal line.